

IN THE SPECIFICATION:

Please replace paragraph number [0004] with the following rewritten paragraph:

[0004] However, as shown in drawing FIG. 1, when the resin or underfill material 1 flows to fill the horizontally oriented cavities 3, the flow is usually not uniform due to various design factors of the semiconductor device 32 and lead frame 33 and gravity acting on the resin 1. As a result, the fronts 1a, 1b of the resin 1 flowing above and below the semiconductor device 32 will often meet above the semiconductor device 32 instead of at the vent, causing the molded package to have undesirable air pockets and/or voids 2, as shown in drawing FIG. 2. These types of defects not only degrade the outer appearance of the molded package, but also produce reliability problems with respect to its resistance to thermal shock and exposure to humidity and other contaminants.

Please replace paragraph number [0006] with the following rewritten paragraph:

[0006] Along with the previously discussed problems in transfer molding, methods in flip-chip packaging are known to present similar problems of voids and/or air pockets in underfill material 1 in a gap between a bumped semiconductor die and a substrate. As shown in drawing FIG. 3, such methods include a one-sided or two-sided dispense process, where an underfill material, such as resin 1, is dispensed along one or two adjacent sides of the semiconductor die 52. The underfill resin 1 then freely flows by capillary action between the semiconductor die 52 and substrate 64, pushing air existing in the gap between the die 52 and the substrate 64 from opposing sides of the semiconductor die 52 as the underfill material 1 fills the gap, thereby minimizing potential voids. However, as shown in drawing FIG. 3, the underfill resin 1 will often leave air pockets or voids 2 adjacent the ~~bumps~~ conductive structures 56 of the flip-chip semiconductor die 52. Further, it is desirable to improve the time it takes to fill the gap with the underfill material.

Please replace paragraph number [0030] with the following rewritten paragraph:

[0030] A third embodiment of the present invention is illustrated in drawing FIG. 6, depicting resin 24 filling a transfer mold 5'' in a substantially vertical direction to cover at least a portion of the ~~second~~ active surface 45 of the substrate 42. The third embodiment is similar to the second embodiment in all respects, except the second half 14'' of the transfer mold 5'' includes a plurality of projections 50 configured to extend to the active surface 45 of the substrate 42 and contact bond pads 47 thereon. The projections 50 extending from the second half 14'' of the transfer mold 5'' allow resin 24 to rise vertically around the projections 50. Thus, bond pads 47 on the ~~second~~ active surface 45 of the substrate 42 that are contacted by projections 50 are shielded from resin 24 and are free of resin 24. Therefore, the resin-free bond pads 47 of the substrate 42 can receive solder balls or the like without further significant modification of the layer of resin 24 on surface 45. Moreover, the openings formed in resin 24 may define the configurations of at least the lower portions of solder bumps or other conductive structures formed on bond pads 47.

Please replace paragraph number [0031] with the following rewritten paragraph:

[0031] A fourth embodiment of the present invention is illustrated in drawing FIG. 7, depicting resin 24 filling the cavity 10''' of a transfer mold 5''' in a substantially vertical direction to cover at least the second surface 55 of the substrate, in this case a flip-chip type semiconductor die 52. Of course, the cavity 10''' may alternatively be configured to hold and facilitate encapsulation of an individual semiconductor die 52, a plurality of individual dice, or a wafer or other large-scale substrate with a plurality of semiconductor devices thereon. The fourth embodiment is similar to the second embodiment in all respects, except the semiconductor die 52 includes conductive structures 56, such as balls, bumps, pillars, or columns including a conductive material such as a solder, other metal or metal alloy, a conductive epoxy, a ~~conductor-filled~~ conductor-filled epoxy, or a z-axis conductive elastomer, predisposed on and protruding from the bond pads thereof. Additionally, the second half 14''' of the transfer mold 5''' may include a plurality of recesses 58 formed in and configured to substantially conformally receive at

least portions of conductive structures 56 so as to prevent resin 24 from completely covering the same.

Please replace paragraph number [0034] with the following rewritten paragraph:

[0034] A sixth embodiment is illustrated in drawing ~~FIG's.~~ FIGS. 9 and 10, depicting resin 24 filling a gap 72 between a semiconductor die 52 and a substrate 64, such as a carrier substrate or an interposer (i.e., a flip-chip assembly 62) in a substantially vertical direction. In the sixth embodiment, at least one barrier 76 is disposed adjacent the periphery 51 of semiconductor die 52 and includes a space or opening 78 formed therein and configured to facilitate dispensing or injecting the resin 24 into a gap 72 between the semiconductor die 52 and the substrate 64. Further, as a dispenser 82 provides resin 24 through opening 78, the resin 24 preferably fills the gap 72 between the substrate 64 and die 52 via capillary action, although positive or negative pressure may be applied to resin 24 as known in the art to accelerate the flow of resin 24 into the gap 72. As such, the at least one barrier 76 is provided to contain the resin in the gap 72 between the semiconductor die 52 and the substrate 64. Accordingly, as in the previous embodiments, it can be well appreciated that gravity provides a more uniform flow front 26, wherein the gravitational force induces the resin 24 to fill in spaces above ~~solder bumps~~ conductive structures 66 where potential air pockets and/or voids are conventionally formed around the ~~solder bumps~~ conductive structures 66 in the gap 72 between the substrate 64 and semiconductor die 52.